

What is claimed is:

1. An apparatus for determining the position of incidence of radiation, comprising
a solid-state device with internal gain, and
a means for using charge separation to obtain electrical signals from said device in response to incidence of radiation,
whereby the position of incidence of radiation is calculated using a plurality of said electrical signals.
2. The apparatus of claim 1, wherein said solid-state device is an avalanche photodiode.
3. The apparatus of claim 1, wherein said solid-state device is a solid state photomultiplier.
4. The apparatus of claim 1, further comprising
a means for calculating from said electrical signals the energy of the incident radiation.
5. The apparatus of claim 4, wherein said solid-state device is an avalanche photodiode.
6. The apparatus of claim 1, further comprising
a means for calculating from said electrical signals the energy of the incident radiation, and
a means for calculating from said electrical signals the time of incidence of pulsed radiation.
7. The apparatus of claim 6, wherein said solid-state device is an avalanche photodiode.
8. An apparatus for determining the position of incidence of radiation, comprising
a solid-state device with internal gain,
a plurality of electrically conductive structures that use charge separation to obtain electrical signals from said device in response to incidence of radiation, and
a means for calculating the position of incidence of radiation using a plurality of said electrical signals.
9. The apparatus of claim 8, wherein said solid-state device is an avalanche photodiode.
10. The apparatus of claim 8, wherein said solid-state device is a solid state photomultiplier.
11. The apparatus of claim 8, further comprising
a means for calculating from said electrical signals the energy of the incident radiation.
12. The apparatus of claim 11, wherein said solid-state device is an avalanche photodiode.
13. The apparatus of claim 8, further comprising
a means for calculating from said electrical signals the energy of the incident radiation, and
a means for calculating from said electrical signals the time of incidence of pulsed radiation.

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14. The apparatus of claim 13, wherein said solid-state device is an avalanche photodiode.
15. The apparatus of claim 8, further comprising
one or more termination lines between the conductive structures, disposed to eliminate
geometric distortion in the electrical signals.
16. The apparatus of claim 8, further comprising
a means of correcting for geometric distortion in coordinates calculated from said electrical
signals using a termination line or lines between said conductive structures.
17. A method for determining the position of incidence of radiation on a solid state device with
internal gain, comprising the steps of:
arranging a plurality of electrically conductive structures with respect to said solid state
device that obtain by charge separation electrical signals from said device in response to
incidence of radiation, and
calculating the position of incidence of said radiation using a plurality of said electrical
signals.
18. The method of claim 17, wherein said solid-state device is an avalanche photodiode.
19. The method of claim 17, wherein said solid-state device is a solid state photomultiplier.
20. A method of measuring the energy of incident radiation on a position sensitive solid state
detector with internal gain, comprising the steps of
extracting an electrical signal from a single contact that indicates the total energy incident on
said detector, and
calculating said total incident energy from said electrical signal.
21. The method of claim 20, further comprising the step of
obtaining the time of incidence from said electrical signal.

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